

condition of the integument in *Didelphys*; and I cannot find any reasons for believing that the integumental glands, which will shortly be described, are any smaller in *Didelphys* than in *Myrmecobius*.

Apart, however, from the question as to whether the external appearance of the glandular patch in *Myrmecobius* is really different from that of *Didelphys dimidiata*, there is a close agreement between the two species in the microscopic structure of the gland. The sternal gland of *Myrmecobius* is a complex structure. The epidermis in this region is greatly thickened and contains numerous sudoriferous glands grouped together into oval masses. Beneath the dermis is a large compound gland the structure of which resembles the sudoriparous glands.

In *Didelphys dimidiata* the elements entering into the formation of the glandular patch are precisely the same as in *Myrmecobius*. As in that species, there are a few hairs scattered over the surface of the gland which are too small and too few to be recognized by the naked eye. The same groups of modified sudoriparous glands as those which I termed sudoriparous follicles in *Myrmecobius* occur in *Didelphys dimidiata*. And, finally, underneath the dermis is a compound tubular gland which, however, appears to be relatively smaller than in *Myrmecobius*.

To describe these various glandular structures more in detail is unnecessary, as such a description would be a mere repetition of the greater part of my paper upon *Myrmecobius*.

It is interesting to find that there exists in both these genera, which are not in other respects very nearly related, a glandular apparatus having the same anatomical relations and the same minute structure¹.

5. Note on a new Gregarine.

By FRANK E. BEDDARD, M.A., Prosector to the Society.

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The Gregarine described in the present note was found in a *Perichæta* which has recently been sent to me from New Zealand by Mr. W. W. Smith. This species occurred in the *vesiculæ seminales* and in the body-cavity, and is a large Gregarine, reaching a length of $1\frac{1}{2}$ –2 millim. I observed three stages in the development of this parasite, which I cannot identify with any described form.

The smallest examples that I observed were about the same size as the common *Monocystis lumbrici*, but of a different form, which is illustrated in the accompanying woodcut. The body is globular, and furnished with one or two slender processes usually of greater length; they are placed (if there are two) one at each end of the body, so that the Gregarine has the appearance of a bead strung upon a thread. I only observed individuals of this stage in the *vesiculæ seminales*. The body-cavity of the *Perichæta* was crowded

¹ P. Z. S. 1887, p. 527.

with individuals of the next stage ; this is characterized by its larger size and rather more complicated structure. The general form of the body is, however, the same. The drawing (p. 357) illustrates this stage, as well as the encysted condition to be presently described. The upper part of the figure represents an individual of the second stage ; the lower part illustrates the encysted condition, in which the whole Gregarine is enclosed by a cyst which is limited in the figure to the lower process.

In the second stage the body is limited externally by a clear membrane of some thickness, which is probably the cuticle ; the coarse granules which fill the interior of the parasite are sometimes restricted to the globular part of the body, and are sometimes also found in one or both of the slender processes. These differences are, however, probably due to movements in the protoplasm of the living Gregarine, which has been arrested at various intervals. The surface of the two processes, and probably of the whole body, is covered with delicate fibres, which generally run obliquely to the long axis of the process, as is shown in the diagram (*b*). Careful focusing shows these fibres to be quite superficial, and they are therefore probably cuticular. During this stage, and also in the earlier stages, the Gregarine multiplies by transverse fission—a process rare among the Gregarinida¹.

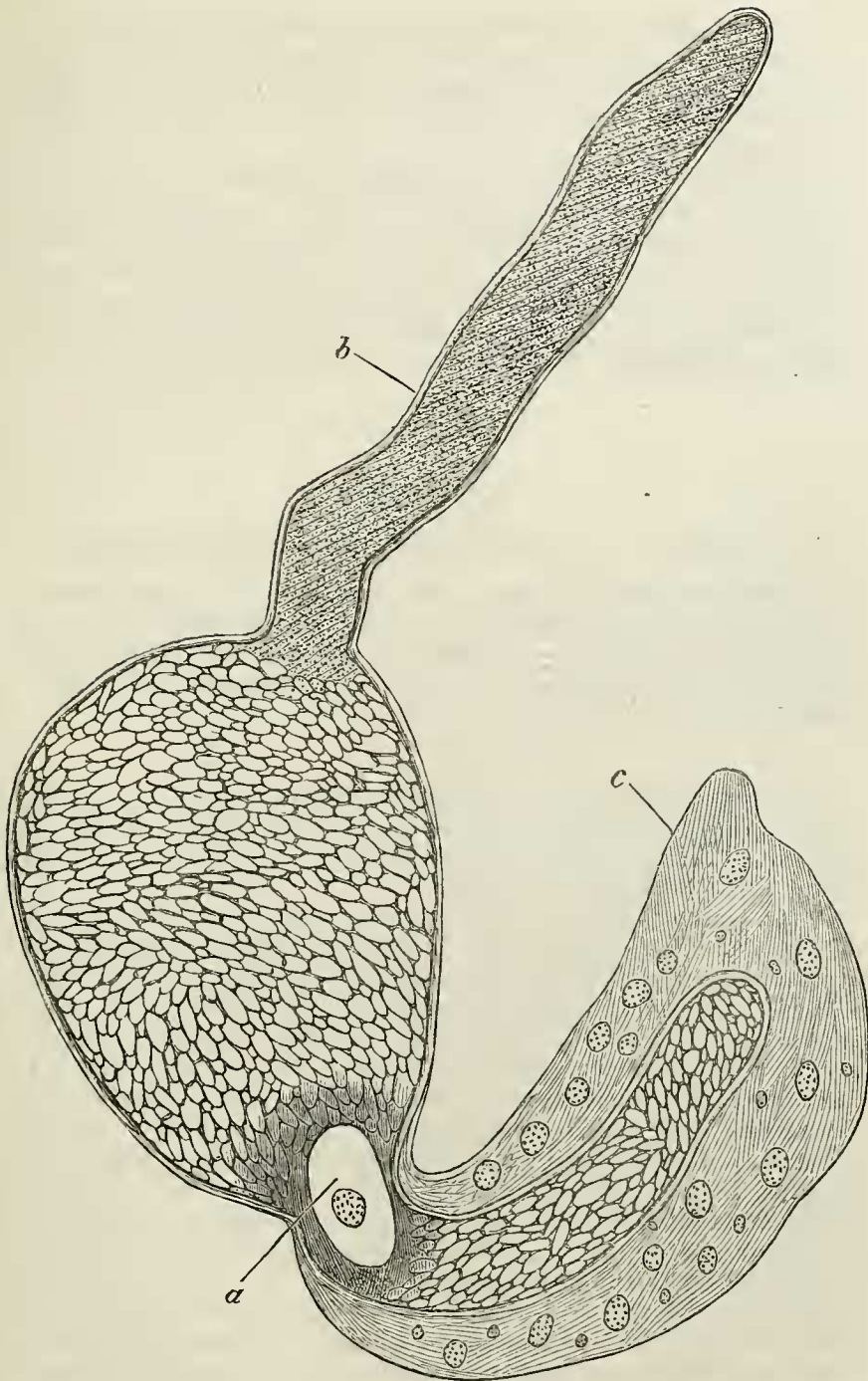
The extremity of one of the processes becomes swollen and filled with the granules of the entoplasm. This swelling increases in size until it equals the body of the parent ; a process grows out from the end opposite to that by which it is attached to the parent ; these two then probably separate.

In the third stage the body of the parasite is covered externally with a remarkable cyst. Individuals in the encysted condition were only met with in the substance of the vesiculæ seminales of the *Perichaeta*.

The structure of the cyst-membrane is illustrated in the lower half of the drawing (*c*). It is of great thickness upon the one or two processes into which the body of the Gregarine is prolonged ; it is, however, much thinner upon the spherical region of the body. The main mass of the cyst has a fibrous appearance, and imbedded in it are numerous bodies which I cannot but regard as nuclei ; these latter were evident in transverse-sections, as well as in glycerine preparations of the entire parasite. The presence of nuclei in the cyst leads me to infer that the latter is not (at any rate entirely) formed by the parasite ; the fibrous portion of the cyst, on the other hand, looks as if it were an hypertrophied condition of the fibroid investment found in the free living parasites of the coelom described above as stage 2.

In some of the encysted parasites there was a single large nucleus (*a*) ; in others a large number of smaller nuclei ; this condition is no doubt preliminary to sporulation. Karyokinetic figures were observed¹ in the dividing nuclei.

¹ Figured by Ruschhaupt (Jen. Zeitschr. 1885, Taf. xxii. fig. 13) in *Mono-cystis porrecta*.



Gregarine from body-cavity of *Perichæta novæ-zelandiæ*.

a, nucleus ; *b*, process of body showing oblique striation of cuticle ; *c*, posterior process of body to show the outer cyst-membrane enclosing nuclei.

The drawing is a compound one ; the middle part of the body and the upper process represent a free (unencysted) individual ; the lower process that of an encysted individual.

I regret to have no further stages in the life-history of this Gregarine; I have not yet seen any evidence of sporulation, except in the division of the nucleus. I propose, however, to publish a fuller description later, when I may perhaps have succeeded in discovering the formation of spores.

I think it is clear that this organism is a *Sporozoon*, and that it belongs to the Gregarinidæ; I refer it to the true Gregarines on account of its general form, the nature of the granules in the protoplasm, &c. But the cyst is quite unlike anything that has been recorded in a Gregarine¹. On the other hand, in the Myxosporidia cysts are met with which are nucleated, and probably therefore formed pathologically by the tissues in which the parasite lives.

June 19, 1888.

Prof. Flower, C.B., LL.D., F.R.S., President, in the Chair.

A letter was read addressed to the President by Dr. Emin Pasha, dated Tunguru Island (Lake Albert), October 31st, 1887, announcing the despatch of further collections of natural-history objects, and promising for the Society some notes on European migratory birds observed in that country.

The following extract from a letter addressed by Mr. E. L. Layard, F.Z.S., H.B.M. Consul at Nouméa, New Caledonia, to Mr. J. Ponsonby, F.Z.S., concerning the distribution of some Land-shells of the genus *Stenogyra*, was read:—

“Mr. Garrett’s remarks (P. Z. S. 1887, p. 185) on the distribution of *Stenogyra tuckeri* remind me to tell you that he wished me to communicate to the Zoological Society the fact that the West-Indian species, *S. octona*, has suddenly turned up here in thousands; how introduced none can tell. They are on a coffee-estate at Kanala on the East Coast, about halfway to the north end of the island. I have made inquiries, and cannot learn that Mons. Evain (presumably the planter) ever had any seed coffee from the West Indies. All he planted came from Bourbon, and it would be interesting to find out whether the species has appeared there also. Mons. Evain’s nephew, who collects shells, found it here, and gave it to me as a fine example of *S. souverbiei*, our native species. I recognized it at once; but he was much astonished on being shown what it was. He says it is in thousands. Garrett said that this fact might throw light on the distribution of the other species. I have always maintained that there was no difference between *S. souverbiei*, *S. artemois*, *S. tuckeri*,

¹ Waldenburg (Arch. Path. Anat. 1862) speaks of a *nucleated* cyst-membrane in certain Gregarines of the Earthworm. Bütschli, however (Bronn’s ‘Thierreich,’ Protozoa, p. 536, note) is disinclined to believe in Waldenburg’s statement. It may be that Waldenburg has found cysts in *Lumbricus* like those of *Perichæta* described here.

